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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/452,749	12/01/1999	ALEXANDRE M. ZAGOSKIN	M-7971-US	1708

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EXAMINER
WILLE, DOUGLAS A

ART UNIT	PAPER NUMBER
2814	

DATE MAILED: 02/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/452,749	ZAGOSKIN, ALEXANDRE M.	
	Examiner	Art Unit	
	Douglas A Wille	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 December 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18 and 28-65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18,28-65* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s) _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3 – 5, 28, 29, 33, 34, 54, 56, 58 and 60 - 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tinkham in view of Char et al.

3. With respect to claims 1, 28, 29 and 33, Tinkham shows a representative small system, i.e. mesoscopic, made up of a small superconducting island connected to charge reservoirs (page 248 top paragraph) and further, a small superconducting island connected to two macroscopic superconducting leads (page 256, last full paragraph). Tinkham does not detail the materials of the island, the leads or the JJs. Char et al. show the formation of grain boundary JJs of high temperature superconductor material (see cover Figures and column 2, line 3 et seq.) where an island 310 is connected to a body 312. It would have been obvious to use the Char et al. structure for the Tinkham device since it is known to be functional. With respect to claims 1, 28 and 60, it would be obvious to provide the best quality crystal structures since this is standard in semiconductor processing. With respect to claims 3, 4, 5 and 29, Char et al. shows d-wave materials. With respect to claims 54, 56 and 58, the oppositely directed currents are inherent. With respect to claims 60 – 63, tunneling occurs in the SQUID and with respect to claim 64 it is known to use a field generator to affect the device and with respect to claim 65, it is known that a circulating supercurrent produces a magnetic field.

4. With respect to claim 34, it would have been obvious to use a metal as a weak link since it is known in the art and would be a design alternative.

5. Claim 2, 30, 31 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tinkham in view of Char et al. and further in view of Shnirman et al.

6. With respect to claims 2, 30 and 31, Tinkham and Char et al. show the basic device and Shnirman et al show the use of a SET to read out a JJ q-bit (see Figure 1 and page 57, second column et seq.). It would have been obvious to modify the Char et al. device to include the SET to provide a readout for the Tinkham and Char et al. device. With respect to claim 52, the oppositely directed currents are inherent.

7. Claims 6 and 8 – 10, 35, 39, 40, 41, 53, 55, 57 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tinkham in view of Char et al. and further in view of Baechtold et al.

8. With respect to claims 6, 8 – 10, 30, 31, 35, 40 and 41, Baechtold et al. show a binary circuit consisting of a series/parallel arrangement of JJs (see Figure 4 and column 5, line 57 et seq.). It would have been obvious to use the Tinkham and Char et al. structure in the Baechtold et al. device to provide the JJs. With respect to claim 53, 55, 57 and 59, the oppositely directed currents are inherent.

9. Claim 7, 11 – 18, 36, 37, 42, 43, 45, 46 and 48 - 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tinkham et al. in view of Char et al., Baechtold et al. and further in view of Shnirman et al.

10. With respect to claims 7, 11, 36, 37 and 43 it would have been obvious to use the Shnirman et al. structure to provide a readout for the device.

11. With respect to claims 12 – 18, 42, 45, 46 and 48 - 50 it would be obvious to apply the structures described above in various combinations since the basic combination is shown and additional combinations would expand the usability of the device. This would be similar to combining normal devices such as FETs to provide further circuit functions.

12. Claims 32, 38, 44, 47 and 51 are rejected under the art shown above since it the devices are inherently parity keys.

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 1 – 18 and 28 - 65 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 – 6, 12, 14, 15 and 18 - 25 of U.S. Patent No. 6,459,097 in view of Char et al. The claimed device has a grain boundary Josephson junction. The patent shows a Josephson junction without specifying that it is a grain boundary. Char et al. shows that a Josephson junction can be formed with a grain boundary and it would be obvious to use the Char et al. grain boundary Josephson junction in the device of the patent.

Response to Arguments

1. Applicant's arguments filed 12/3/02 have been fully considered but they are not persuasive.

2. Applicant argues that the Char et al. technique will not produce a clean JJ but note that Tinkham shows the basic device and Char et al. is relied upon to show the use of a grain boundary as a JJ and there is no reason to assume that the grain boundary must necessarily be produced by the Char et al. method. Applicant further states that neither Shnirman et al. nor Baechtold et al. remedy the shortcomings of Char et al. but since there are no shortcomings, there are no shortcomings to remedy.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A Wille whose telephone number is (703) 308-4949. The examiner can normally be reached on M-F (6:15-3:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the

organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Douglas A. Wille
Patent Examiner

February 13, 2003